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S. 141  
P. 4  
90-43

Agricultural Department Bulletin No. 90-93

EXCHANGE  
SEP 18 1922

PROVINCE OF BRITISH COLUMBIA

DEPARTMENT OF AGRICULTURE

# YIELDS, GRADES, PRICES AND RETURNS

FOR

## Apple Varieties in the Okanagan Valley

By

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Vancouver*

COLLEGE OF AGRICULTURE CIRCULAR No. 4

The funds providing for this investigation and for the publication of the report are  
allocated under the Agricultural Instruction Act, 1913, Canada





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## Introduction



FRUIT-GROWING has received and is receiving more attention in the Okanagan Valley than any other form of agricultural activity, and undoubtedly, owing to the suitability of the Valley for the growing of fruit and the commercial importance of this crop, continued interest and study will be given to any problem the solution of which may affect the returns from orchards.

In the past the study of the different varieties of apples has received no small share of attention from orchardists and horticulturists, and at the present time this is still one of the most interesting and important subjects connected with the fruit industry. So many arguments can be advanced, both in favour of and against the exclusive production of the numerous varieties of apples now grown, that it is difficult to decide on the relative merits of the outstanding varieties, and to advocate the planting of certain ones to the exclusion of the others.

Some varieties are markedly influenced by variations of local climatic and soil conditions, whereas others are capable of thriving under quite a wide range of conditions. It is obvious, then, that while some consideration must be given to the results accomplished in the case of a particular variety in any given district, nevertheless the general yielding power of a variety and its market value must always be carefully taken into account if greatest returns are to be expected.

Heretofore, practically no information has been published showing a comparison of the different varieties of apples as to their commercial importance from the fruit-grower's point of view. For this reason the Department of Horticulture of the University of British Columbia has decided to undertake an investigation of apple varieties, and work along this line has been carried on during the season of 1921.

### OBJECT OF INVESTIGATION.

The object of this investigation has been to determine as accurately as possible at the present time the average yields, grades, prices and returns for the different varieties of apples now being grown more or less commercially in the Okanagan Valley, and to show thereby the relative commercial importance of these varieties.

It is advisable at this point to draw attention to the fact that this is a preliminary report, the purpose of which is merely to present in concise form such information, obtained during the course of the survey, as is thought will be of value to fruit-growers, prospective fruit-growers, and others interested in the fruit industry. No attempt is made to draw hard and fast conclusions from the data at hand. To do so would hardly be justified, since it is recognized that the records are not as complete as is desirable for that purpose. Even though one hundred and eighty-nine orchards are included in the survey, still, for some varieties or for certain ages of trees within the varieties studied, the records may not be sufficiently extensive; had it been possible to include more records, the resulting figures might have been somewhat altered. Furthermore, it is possible that the average returns from older trees might be found to differ from the returns as recorded in this report, which deals only with trees from five to fourteen years of age.

In examining this report it should be borne in mind that the figures shown represent averages rather than extremes, the average being the only safe basis

NOTE.—The author of this report wishes to make grateful acknowledgment to Mr. F. M. Clement, Dean of Agriculture and Professor of Horticulture in the University of British Columbia, for his many helpful suggestions in the carrying on of the work of the survey; and to Mr. A. F. Barss, Associate Professor of Horticulture, for his assistance in the formulating of this report. Acknowledgment is also made to the many orchardists and other fruit men who supplied information for this report, and without whose ready co-operation this work would have been impossible.

for comparison. These figures, therefore, will not show as high returns as are generally looked for under best orchard conditions and management.

Although this is a preliminary report, in which no attempt has been made to draw definite conclusions, it is felt that the results recorded for the different varieties shown therein will be of value and interest; that they will induce fruit-growers and horticulturists to study more carefully from an economic standpoint the relative merits of apple varieties, and that they will assist the grower to decide for himself whether it would be to his ultimate advantage or disadvantage to eliminate his poor varieties and replace them with more profitable ones.

#### METHOD OF COLLECTING DATA.

As has been said, records of one hundred and eighty-nine different orchards are included in the survey. These orchards, which on the whole may be considered as average, are located in the Vernon, Kelowna, Summerland, Naramata and Penticton fruit districts. All are under irrigation. Records for each variety were taken from as many different orchards as possible, so that the results would show a fair average for each variety considered.

Records on yields, grades and prices for the different varieties were obtained chiefly from the fruit-packing houses handling the fruit of the various orchards included in the survey. Later, these orchards were visited to determine the number and age of the trees of each variety and the general condition of the orchard.

Only the fruit that passed through the shipping houses graded as marketable fruit was recorded. No attention was paid to culls, or to fruit that had been reserved for home consumption.

No account was taken of any one orchard unless records of yields were obtainable for two, four, six or eight years. This precaution was observed so that, in case the varieties showed any tendency toward the alternate bearing habit, the averages would be obtained from an equal number of bearing and non-bearing years.

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## Comparison of Apple Varieties

#### VARIETY AVERAGES.

The report shows a comparison of twenty-five different varieties of apples. Additional varieties were studied, but have been omitted from the report because of the lack of sufficient data to give reliable averages. While it is possible that the average yield of some of the varieties mentioned in the following table might be affected to some extent if a greater number of records were obtained, still it is felt that, with the data available, a fair average has been secured. The varieties in which yield averages have been based on comparatively few records are Gano, Gravenstein, Ontario, Stayman Winesap, St. Lawrence, Tompkins King, and Yellow Transparent.

#### YIELDS.

The yields recorded in this report show what has been accomplished in the different varieties grown under average Okanagan conditions during the period from 1914 to 1920, inclusive. It should be remembered that, owing to the war, conditions were not entirely normal during this period. Labour was scarce, and for this reason many orchards did not receive proper attention. As all varieties were subjected to practically the same treatment, however, the comparison among them should not be materially affected.

Yield records collected for the different varieties show considerable fluctuation; and this suggests that these same varieties, growing under favorable conditions and receiving good care, are capable of producing much larger crops than the averages shown in the following tables would indicate. It is quite likely that yield averages in all varieties, excepting those unsuited to the Valley, will be considerably increased in the future, since the fruit-grower is realizing more and more the value of producing large crops, and consequently is giving more attention to cultural methods.

In preparing the following three tables on yields, the total yield for each variety at each age was first obtained; this figure was then divided by the total number of trees of the age which produced that yield, the resulting figure being called "Average yearly yield per tree." The four, eight and ten-year total yields were obtained by adding the "average yearly yield per tree" for each of the ages included in each table. Forty pounds was taken as the average weight of fruit in each box of all varieties.

TABLE No. 1.

Showing Total and Average Yearly Yields per Tree. (Four-year Period.)  
Trees Five to Eight Years of Age, Inclusive.

Variety.	Total Yield Four Years.	Average Yearly Yield per Tree	
		In Pounds.	In Boxes.
Canada Baldwin .....	7.63 boxes	76.3	1.91
Ben Davis .....	7.49 "	74.9	1.87
Snow (Fameuse) .....	5.81 "	58.1	1.45
Duchess .....	5.59 "	55.9	1.40
McIntosh .....	5.20 "	52.0	1.30
Ontario .....	5.10 "	51.0	1.27
Wealthy .....	5.03 "	50.3	1.26
Winter Banana .....	5.02 "	50.2	1.25
Jonathan .....	4.87 "	48.7	1.22
Gano .....	4.66 "	46.6	1.16
Wagener .....	4.63 "	46.3	1.16
Yellow Transparent .....	4.44 "	44.4	1.11
Cox Orange .....	4.29 "	42.9	1.07
Gravenstein .....	4.20 "	42.0	1.05
Stayman Winesap .....	4.06 "	40.6	1.01
Rome Beauty .....	4.00 "	40.0	1.00
St. Lawrence .....	3.90 "	39.0	.98
Tompkins King .....	3.50 "	35.0	.88
Delicious .....	3.33 "	33.3	.83
Grimes Golden .....	3.28 "	32.8	.82
Spitzenburg .....	3.14 "	31.4	.78
Jefferies .....	2.96 "	29.6	.74
Winesap .....	2.37 "	23.6	.59
Yellow Newtown .....	2.12 "	21.2	.53
Spy .....	.51 "	5.2	.13

TABLE No. 2.

Showing Total and Average Yearly Yields per Tree. (Eight-year Period.)  
Trees Five to Twelve Years of Age, Inclusive.

Variety.	Total Yield Eight Years.	Average Yearly Yield per Tree	
		In Pounds.	In Boxes.
Canada Baldwin .....	30.18 boxes	150.9	3.77
St. Lawrence .....	27.12 "	135.6	3.39
McIntosh .....	26.3 "	131.5	3.29
Snow (Fameuse) .....	23.84 "	119.2	2.98
Winter Banana .....	23.22 "	116.1	2.90
Rome Beauty .....	20.56 "	102.8	2.57
Gano .....	20.5 "	102.5	2.56
Ben Davis .....	19.3 "	96.5	2.41
Delicious .....	18.72 "	93.6	2.34
Wealthy .....	18.66 "	93.3	2.33
Stayman Winesap .....	17.18 "	85.9	2.15
Duchess .....	16.16 "	80.8	2.02
Ontario .....	16.12 "	80.6	2.01
Jonathan .....	15.94 "	79.7	1.992
Gravenstein .....	15.9 "	79.5	1.988
Yellow Transparent .....	15.74 "	78.7	1.97
Tompkins King .....	15.6 "	78.0	1.95
Wagener .....	15.34 "	76.7	1.92
Jefferies .....	14.42 "	72.1	1.80
Grimes Golden .....	14.02 "	70.1	1.752
Cox Orange .....	14.0 "	70.0	1.75
Yellow Newtown .....	13.88 "	69.4	1.735
Winesap .....	12.94 "	64.7	1.62
Spitzenburg .....	12.9 "	64.5	1.61
Spy .....	7.28 "	36.4	.91



TABLE No. 3.

Showing Total and Average Yearly Yields per Tree. (Ten-year Period.)  
Trees Five to Fourteen Years of Age, Inclusive.

Variety.	Total Yield Ten Years.	Average Yearly Yield per Tree	
		In Pounds.	In Boxes.
St. Lawrence .....	43.5 boxes	174.15	4.35
McIntosh .....	41.1 "	164.25	4.11
Canada Baldwin .....	41.0 "	164.01	4.10
Winter Banana .....	36.3 "	145.23	3.63
Snow (Fameuse) .....	33.3 "	133.20	3.33
Rome Beauty .....	33.3 "	133.20	3.33
Wealthy .....	30.8 "	123.26	3.08
Gano .....	30.1 "	120.47	3.01
Ben Davis .....	29.3 "	117.06	2.93
Tompkins King .....	28.6 "	114.32	2.86
Ontario .....	26.1 "	104.42	2.61
Yellow Transparent .....	25.2 "	101.01	2.52
Jonathan .....	25.1 "	100.40	2.51
Stayman Winesap .....	24.9 "	99.75	2.49
Gravenstein .....	24.6 "	98.45	2.46
Yellow Newtown .....	24.2 "	97.04	2.42
Duchess .....	22.8 "	91.13	2.28
Jefferies .....	22.6 "	90.46	2.26
Grimes Golden .....	22.3 "	88.68	2.23
Wagener .....	21.7 "	86.97	2.17
Winesap .....	19.8 "	79.20	1.98
Cox Orange .....	19.3 "	77.18	1.93
Spitzenburg .....	18.1 "	72.23	1.81
Spy .....	15.6 "	62.57	1.56

NOTE: No records were received on Delicious trees thirteen and fourteen years of age; consequently this variety is not included in Table No. 3.

In examining the foregoing tables (Tables Nos. 1, 2 and 3), it is important to note the change in relative standing of several of the varieties. Some varieties, it will be observed, are consistently high yielders, others low yielders. Other varieties, again, which show comparatively low yields when five to eight years of age, show comparatively high yields when a greater number of years is reckoned in obtaining the average. Still other varieties, which appear to be relatively heavy producers while the trees are young, do not continue to hold their place as they grow older, but are forced towards the bottom of the list.

It will also be observed that there is a wide variation in yield among some of the varieties. Generally speaking, varieties which are consistently low producers year after year may be considered unsuited to the Okanagan Valley. A possible exception to this rule would be the case of those small-growing varieties, which are especially useful in orchards as temporary, early-bearing, filler trees; the low yield per tree in these instances is due to the fact that the trees by nature do not develop large frameworks with extensive bearing surfaces.

#### GRADE PERCENTAGES.

It is well known that the market value of the lower grades of fruit is considerably below that of the best grades. The advantage, therefore, of having, in a given tonnage of any one variety, a large percentage of the top grade fruit is obvious. That not all apple varieties average the same percentage of fruit in the three higher commercial grades is clearly shown in Table No. 4. The grade percentages here shown are average for the four-year period which includes the years 1917, 1918, 1919 and 1920.

TABLE No. 4.

Showing Average Grade Percentages of the Different Varieties for the Four-year Period, 1917, 1918, 1919 and 1920.

Variety.	No. 1's.	No. 2's.	No. 3's.
Stayman Winesap.....	84%	13%	3%
Delicious .....	83	14	3
Tompkins King .....	81	13	6
Gano .....	80	15	5
Spitzenburg .....	77	17	6
Winter Banana .....	76	18	6
Winesap .....	75	14	11
Grimes Golden .....	74	20	6
Rome Beauty .....	72	19	9
Yellow Newtown .....	71	19	10
Jonathan .....	70	24	6
Ben Davis .....	68	26	6
Snow (Fameuse) .....	66	27	7
McIntosh .....	65	29	6
St. Lawrence .....	64	33	3
Cox Orange .....	63	27	10
Canada Baldwin .....	59	39	2
Wealthy .....	58	36	6
Gravenstein .....	58	39	3
Wagener .....	57	33	10
Spy .....	55	37	8
Ontario .....	53	33	14
Yellow Transparent .....	50	35	15
Jefferies .....	49	46	5
Duchess .....	36	60	4

As will be noted from the above table, there is a wide spread in grade percentages among some varieties. Only four varieties have on the average graded 80 per cent. or more of No. 1 apples; seven have graded between 70 and 80 per cent.; five between 60 and 70 per cent.; and two have gone below 50 per cent. on No. 1 grade. The effect that grade percentages have on the total returns for the different varieties will be shown in Tables Nos. 6, 7 and 8.

#### PRICES.

Prices during the four years—1917, 1918, 1919 and 1920—varied a great deal, but on the average they were much higher than prices in previous years. The different varieties, however, kept approximately the same relative position in the price scale from season to season during these four years, a fact which indicates their relative popularity on the market. Some varieties, such as Ben Davis, Gano, Canada Baldwin and St. Lawrence, were grown only in limited quantities. Had such varieties been grown in larger quantities, the market price might have been adversely affected because of their comparatively poor quality.

Table No. 5 contains a list of the twenty-five varieties studied, together with the average net price received by growers for the three grades of each variety during the four-year period, 1917 to 1920.

TABLE No. 5.

Showing Average Net Price per Box Received by Growers for No. 1's, No. 2's and No. 3's During the Years 1917 to 1920, Inclusive.

Variety.	No. 1's.	No. 2's.	No. 3's.
Delicious .....	\$2.18	\$1.63	\$ .79
Snow (Fameuse) .....	1.61	1.36	.73
Spy .....	1.60	1.26	.64
Yellow Transparent .....	1.56	1.38	.98
McIntosh .....	1.54	1.18	.91
Yellow Newtown .....	1.54	1.25	.61
Spitzenburg .....	1.53	1.23	.66
Winter Banana .....	1.46	1.20	.64
Winesap .....	1.43	1.17	.63
Stayman Winesap .....	1.38	1.13	.66
Rome Beauty .....	1.37	1.18	.57
Ben Davis .....	1.36	1.13	.57
Gravenstein .....	1.36	1.12	.83
Duchess .....	1.36	1.14	.97
Tompkins King .....	1.36	1.06	.64
Jonathan .....	1.34	1.05	.65
Wealthy .....	1.34	1.04	.90
Gano .....	1.30	1.08	.55
Grimes Golden .....	1.30	1.02	.71
Ontario .....	1.30	1.04	.61
Wagener .....	1.28	1.04	.58
Cox Orange .....	1.27	.86	.62
Canada Baldwin .....	1.23	1.07	.54
Jefferies .....	1.18	.91	.86
St. Lawrence .....	1.15	1.07	.59

As will be noticed in the above table, there is a difference of over one dollar per box for No. 1's between the high-priced Delicious at the top of the list and the St. Lawrence at the bottom. Whether the Delicious, which has brought a premium price in the past as compared with other varieties, will continue to do so in the future is problematical; but undoubtedly it will always be at or near the top, as it is an apple of excellent quality and good appearance.

In Table No. 5, the varieties are arranged according to the price received for the No. 1 grade of each variety. When it is remembered (as was shown in Table No. 4) that the grades vary greatly between varieties—that they range from 84 down to 36 per cent. in the case of No. 1 fruit, while grades No. 2 and No. 3 vary just as widely—it will be seen that averaging the prices received for No. 1's, No. 2's and No. 3's of any one variety would not give a fair comparison for the different varieties in regard to total returns per tree.

### RETURNS.

The main object of the fruit-grower is to produce maximum yields of fruit at the minimum cost, so that the profits may be as large as possible. The grower, however, must not lose sight of the fact that, apart from yield, grade and price exert no small effect on the returns from the fruit crop.

The following tables, Nos. 6, 7 and 8, indicate the comparative value of the varieties when yields, grades and prices are considered together.

The comparison of returns for the different varieties would be more striking if placed on an acre rather than on a tree basis; but, since the number of trees planted per acre varies a great deal in the different orchards, the acre basis cannot be used.

The yield, of course, exerts the greatest effect on returns; but, as has been observed above, grade and price also have an important effect. This fact is clearly seen in Table No. 7 if one compares, for instance, Delicious with Canada Baldwin. In point of yield, the former shows 18.72 boxes as against 30.18 boxes of the latter; while the returns for these varieties, due to grade and price, show a difference quite the reverse—the Delicious, the lower yielding variety, producing \$3.77 per tree more than the Canada Baldwin.







TABLE No. 8.

Showing Total Returns per Tree. (Ten-year Period.) Trees Five to Fourteen Years of Age, Inclusive.

Variety.	Yield in Boxes.	Grade Percentage			Price per Box.			Returns per Tree.			
		No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	Total.
McIntosh .....	41.1	65	29	6	\$1.54	\$1.18	\$ .91	\$41.12	\$14.04	\$2.28	\$57.44
Winter Banana .....	36.3	76	18	6	1.46	1.20	.64	40.30	7.80	1.41	49.51
Snow (Fameuse) .....	33.3	66	27	7	1.61	1.36	.73	35.42	12.24	1.68	49.34
St. Lawrence .....	43.5	64	33	3	1.15	1.07	.59	31.97	15.41	.77	48.15
Canada Baldwin .....	41.0	59	39	2	1.23	1.07	.54	29.75	17.11	.44	47.30
Rome Beauty .....	33.3	72	19	9	1.37	1.18	.57	32.88	7.43	1.71	42.02
Wealthy .....	30.8	58	36	6	1.34	1.04	.90	23.99	11.54	1.62	37.15
Gano .....	30.1	80	15	5	1.30	1.08	.55	31.33	4.86	.83	37.02
Ben Davis .....	29.3	68	26	6	1.36	1.13	.57	27.06	8.59	1.03	36.68
Tompkins King .....	28.6	81	13	6	1.36	1.06	.64	31.55	3.92	1.09	36.56
Yellow Transparent .....	25.2	50	35	15	1.56	1.38	.98	19.66	12.14	3.72	35.52
Yellow Newtown .....	24.2	71	19	10	1.54	1.25	.61	26.49	5.75	1.46	33.70
Stayman Winesap .....	24.9	84	13	3	1.38	1.13	.66	28.86	3.66	.50	33.02
Jonathan .....	25.1	70	24	6	1.34	1.05	.65	23.58	6.30	.98	30.86
Gravenstein .....	24.6	58	39	3	1.36	1.12	.83	19.45	10.75	.58	30.78
Ontario .....	26.1	53	33	14	1.30	1.04	.61	17.94	8.94	2.26	29.14
Duchess .....	22.8	36	60	4	1.36	1.14	.97	11.15	15.62	.87	27.64
Grimes Golden .....	22.3	74	20	6	1.30	1.02	.71	21.45	4.59	.92	26.96
Winesap .....	19.8	75	14	11	1.43	1.17	.63	21.16	3.28	1.39	25.83
Spitzenburg .....	18.1	77	17	6	1.53	1.23	.66	21.27	3.81	.73	25.81
Wagner .....	21.7	57	33	10	1.28	1.04	.58	15.83	7.45	1.26	24.54
Jefferies .....	22.6	49	46	5	1.18	.91	.86	13.10	9.46	1.07	23.63
Spy .....	15.6	55	37	8	1.60	1.26	.64	13.76	7.31	.96	22.03
Cox Orange .....	19.3	63	27	10	1.27	.86	.62	15.49	4.47	1.18	21.14

# General Observations and Comments Based on the Survey of the Districts

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## I. GRADES.

In this report the results of the survey are presented showing the effect that yield, grade and price have on the returns for the different varieties. It is not practicable in a report of this nature to give such detailed directions as would help the fruit-grower to improve the yields or to strengthen the market price for his fruit. It does seem practicable, however, to suggest briefly the means available by which the percentage of No. 1 fruit may be increased relatively to grades 2 and 3.

In general, grade percentages of nearly all varieties might be considerably raised by better cultural methods and by giving more attention to pruning, thinning, time of picking, and methods of handling.

The Okanagan orchards are on the whole fairly well pruned, but many growers do not practise sufficiently intelligent thinning of fruit to obtain best results. To do this work properly requires a knowledge of the manner in which the fruit is carried on the tree by the different varieties, and also a knowledge of the normal size that the fruit should be when developed. Some varieties do not require heavy thinning, even though the tree may be carrying what appears to be a heavy load of fruit, because the fruit is fairly evenly distributed over the tree. On the other hand, some varieties have a tendency to bunch their fruit; and unless such bunched apples are thinned, to allow proper development for the fruit left on the tree, the percentage of No. 1 apples will be materially decreased.

There is need for more information regarding the proper time to harvest the different varieties of apples. A great deal of money is lost and grade percentages are lowered by picking certain varieties at the wrong time. Invariably, when apples are picked either too green or too ripe, the percentage of No. 1 apples is materially decreased, while the percentage of No. 3's and culls is increased. The cost of handling culls is disproportionately high as compared with the returns, whereas No. 1's and No. 2's will generally return a profit for the time and labour spent on them.

Again, rough handling is often responsible for low percentage of No. 1 apples. Some varieties, especially the early ones, bruise very easily, and must be very carefully handled, otherwise they will not grade out well, and the returns to the grower will be correspondingly reduced. On the score of rough handling, not only is the grower frequently to blame, but the packing-house employees are often guilty. It is the grower alone, however, who has to stand the loss due to such abuse. A careless worker, no matter whether he is handling fruit in an orchard or in the packing-house, should be dismissed; those labourers only should be employed who show that they can and will handle fruit carefully.

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## II. CHOICE OF VARIETIES.

From the tables in this report it is apparent that certain varieties are continually bringing lower returns than others. Nor is it always the low-yielding variety that brings the poorest returns. Occasionally it has been found that orchards containing varieties of high quality but of a comparatively light yield are fully as profitable as orchards containing varieties of inferior quality but with a relatively heavy yield. (In some cases they are even more profitable.) The larger crop in the second instance was not sufficient to offset the lower market price of the inferior quality of fruit.

Varieties showing high yields, high grades and high prices demand the special attention of the fruit-grower. Additional planting of such varieties might wisely be considered. Varieties continually producing small crops of poor quality fruit which sells at low prices are, of course, practically worthless, especially if grown where better varieties would grow successfully.



Two other classes of varieties remain to be considered. In the first place those varieties which show high yields but bring low prices, especially where the present total tonnage is not large, are probably not over-popular on the market and might easily prove unprofitable were the plantings to be greatly increased. Secondly, in the case of varieties which consistently show low yields even though the fruit may bring a high price, it is generally thought inadvisable to attempt widespread plantings in the hope of obtaining large returns, since often these varieties are adapted only to very limited areas. To be on the safe side, farmers who are tempted to cultivate this last class of varieties should try them out in a small way before attempting to make extensive plantings.

Certain facts, however, must be taken into consideration apart from those presented in the tables. The fruit-grower, in choosing varieties, must not be entirely influenced by yield and market price. He must be governed to some extent by local conditions, such as soil and climate. Also he should favourably consider those varieties which ripen at different times, so that the harvest season may be extended without permitting any breaks between the harvestings of the different varieties. Too many orchards in the Valley are what might be termed "unbalanced orchards," in that they contain varieties that ripen at periods which prevent the picking season from being continuous and extended. A well-balanced orchard is one which is planted to varieties that mature their fruit at different dates, so that when one variety is harvested the next is ready for picking. Those orchards which contain varieties that must be picked at practically the same time present the difficulty of securing sufficient labour for a short picking season. On the other hand, where there is a break of two or three weeks between the picking of certain varieties, the grower must find other work for his fruit-pickers during these breaks. Unless, therefore, a grower has a definite assurance of a ready supply of satisfactory pickers who will be available whenever he may need them, his aim should be to choose varieties which are not only good yielders and good sellers, but which mature their fruit at successive periods. This will allow as nearly continuous picking as possible, from the time the earliest variety begins to mature until the latest is ready for harvesting.

Again, the percentage of each variety planted in an orchard should be considered by every grower. As a general rule, referring now to the Okanagan Valley as a whole, a smaller percentage of summer apples should be grown than of fall apples, and likewise a smaller percentage of fall apples than of winter varieties. The reason for this general rule is that, whereas the marketing season is relatively short in the case of the early maturing varieties, it is fairly extended in the case of the later maturing varieties. These varieties indeed may often be marketed over a period of several months where satisfactory common or cold storage is provided.

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### COMMENT ON VARIETIES.

In order to be able to take full advantage of the extended marketing season of apples, it is desirable that the Okanagan should be producing early, medium and late varieties. Only those, however, that are generally known and in demand by the public should be considered for commercial plantings. The growing of other sorts not well received on the market tends to reduce the price on the better varieties, because, in order to dispose of them at a fair price, they must be sold with the better varieties in mixed cars.

Over one hundred different varieties of apples are grown in the Okanagan Valley, but the majority of these are not grown in large quantities. The number of varieties grown for commercial purposes would not exceed twenty-five. In the course of time, however, even this number will decrease, until only those are left that are the most profitable; for, in a specialized fruit district like the Okanagan, only the best varieties will survive, the poor ones being eliminated under keen competition.

In the following section the varieties tabulated in this report are briefly discussed as to their merits from a commercial point of view, and the reasons for the probable increase or decrease in their future production are stated, or suggested.

### III. VARIETIES WHICH ARE LIKELY TO INCREASE IN PLANTINGS AND IN TOTAL PRODUCTION.

*Delicious*: the most popular and profitable late apple grown at present. The trees are apparently well suited to the Okanagan, and, owing to the high quality and attractive appearance of the fruit, this variety should always be in good demand.

*Duchess*: a hardy tree, comparatively small-growing; a good filler. The fruit matures early and has fine culinary qualities. This variety does well in the district from Kelowna north.

*Gravenstein*: a moderately hardy tree. In the Okanagan Valley it appears to be adapted largely to those sections in the southern end which offer conditions most favourable to its production. The fruit is of high dessert quality. Increase will be limited.

*Jonathan*: a tree of medium hardness, and the fruit of good quality. This variety will probably decrease in the fruit sections from Kelowna north, but will increase in the southern end of the Valley, especially when used as a filler.

*McIntosh*: the most popular fall and early winter apple grown. It does particularly well in the fruit districts from Kelowna north. The tree is hardy, and the fruit is of high quality and attractive appearance.

*Rome Beauty*: tree hardy and productive. The fruit has excellent cooking and baking qualities.

*Snow (Fameuse)*: not largely grown, but production likely to increase on account of its hardness, productivity and quality. The chief drawbacks to the variety are susceptibility to apple scab and competition with the McIntosh.

*Stayman Winesap*: a promising variety, especially in the southern end of the Okanagan. Its production may increase in the northern districts. The fruit keeps well, and market demand is comparatively good.

*Wealthy*: a hardy tree, bearing a high quality of fruit. It is well suited to the northern end of the Valley. The crop enters the market after the Duchess and before the McIntosh. The chief drawback is that the McIntosh, coming on the market before the Wealthies are all off, affects the price adversely.

*Winter Banana*: a productive variety that does well in the southern end of the Valley. The market is said to be limited, but undoubtedly it could, and should, be extended, especially to satisfy fancy trade demand. The fruit is of high quality and is very attractive, and, when carefully handled, appears to advantage in the box.

*Yellow Newtown*: a high quality of fruit. The tree develops into full bearing rather slowly. This variety may be favourably considered for planting in certain localities in the southern fruit districts. Will decrease in the northern districts.

*Yellow Transparent*: the leading commercial early apple, excellent for culinary purposes. The tree is hardy. The increase of production will, however, be limited owing to its short period of use.

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#### IV. VARIETIES WHICH ARE LIKELY TO DECREASE IN PLANTING AND IN TOTAL PRODUCTION.

*Ben Davis*: not largely grown because of its poor quality. In the past it has brought a good price when other varieties were off the market. Improved storage facilities will tend to bring other superior varieties into competition with this late apple, and this will affect the price adversely.

*Canada Baldwin*: one of the heaviest producers, but not well received on the market owing to poor quality. It must be sold in mixed carloads with superior varieties in order to obtain a fair price.

*Cox Orange*: unsuited for Okanagan conditions.

*Gano*: In the same class as the Ben Davis, but not so well known.

*Grimes Golden*: a comparatively small-growing tree, bearing fruit of high quality. The skin is subject to scald in storage, and, as this detracts from the appearance of the fruit on the market, the price is thereby adversely affected. This variety will neither increase nor decrease to any marked extent.

*Jefferies*: a comparatively light yielder which fails to compete with superior varieties, such as the McIntosh.

*Ontario*: not largely grown or likely to be, as the fruit is on only fair demand in the market. The tree is of medium hardness.



*Spitzenburg*: a variety whose fruit is of high quality, but whose trees are neither hardy nor productive, since they are susceptible to disease, especially fire-blight.

*Spy*: an apple of high quality. The cost of production is high, however, owing to the fact that the tree is very slow in coming into bearing.

*St. Lawrence*: a heavy bearing variety which, unfortunately, does not bring by itself a good market price, and which, therefore, like the Canada Baldwin, must be sold in mixed carloads with better selling varieties in order to secure a fair price.

*Tompkins King*: a large-growing tree, moderately hardy. The fruit is of high quality, but inclines to water-core. It may show limited increase in some of the favoured sections in the south end of the Valley, but will decrease generally.

*Wagener*: a small-growing tree, of medium hardiness. The fruit, which is subject to water-core, has lost favour on the market of late years. It should be considered as a filler only.

*Winesap*: a fruit of high quality, with a good market demand. This variety, however, has a comparatively light yield in the districts studied. It may be favourably considered for future planting in the extreme south end of the Valley only. It will decrease in the fruit sections north of Penticton.

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## Summary

1. This report shows a comparison of twenty-five different varieties of apples as to yield, grade, price and returns.

2. A wide variation in yields is recorded for the different varieties. Some are consistently heavy yielders, others consistently light yielders, while other varieties vary directly with their age.

3. The different yield records available for each variety show considerable variation, and this fact suggests the possibility of raising the yield average on all varieties except those unsuited to the Valley.

4. The percentage of the different grades varies considerably among the varieties listed. Variety grades for No. 1's vary from 84% to 36%, for No. 2's from 13% to 60%, and for No. 3's from 2% to 15%. (Table 4.)

5. Prices for No. 1 grade apples vary with the varieties from \$2.18 per box down to \$1.15; for No. 2 grade, from \$1.63 per box down to 86 cents; for No. 3 grade, from 98 cents down to 54 cents. (Table 5.)

6. The returns per tree five to eight years of age, inclusive, vary from \$9.30 to 72 cents for the different varieties recorded (Table 6); for trees five to twelve years of age, inclusive, the variation is from \$38.49 down to \$10.18 (Table 7); for trees five to fourteen years of age, inclusive, the variation is from \$57.44 down to \$21.01 per tree for the different varieties (Table 8).

7. Improvement in cultural methods, pruning, thinning, time of picking and method of handling, might increase the percentage of No. 1 fruit obtained.

8. In choosing varieties for future planting, not only should yield, grade and price be considered, but also special adaptability to local conditions. Furthermore, the season of maturing should possibly be taken into account in order that the most economical harvesting might be practised.

9. As a general rule, the total percentage of summer apples grown should be less than that of fall apples, and the percentage of fall varieties less than that of winter varieties.

10. *Varieties Likely to Increase in Production*.—Delicious, Duchess, Gravenstein, Jonathan, McIntosh, Rome Beauty, Snow (Fameuse), Stayman Winesap, Wealthy, Winter Banana, Yellow Newtown and Yellow Transparent.

11. *Varieties Likely to Decrease in Production*.—Ben Davis, Canada Baldwin, Cox Orange, Gano, Grimes Golden, Jefferies, Northern Spy, Ontario, Spitzenburg, St. Lawrence, Tompkins King, Wagener and Winesap.





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